

Trans-obturator tape technique and bladder injury. Cysto-urethroscopic management of intravesically-exposed sling

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Abstract

An intravesical exposed mesh may result from an unrecognized bladder perforation or from bladder erosion after a mid-urethral sling procedure performed to treat a stress urinary incontinence. Introduction of trans-obturator tape and tension-free vaginal tape-obturator techniques have minimized, but not eliminated, the risk of bladder injury. The suggested management of the above complication is removal of the polypropylene mesh from the bladder. Herein, we describe a case of partial intravesically-exposed sling, first diagnosed by trans-labial ultrasound, confirmed by cysto-urethroscopy and successfully treated with endoscopic transurethral resection.

Introduction

Modern management of female stress urinary incontinence (SUI) using slings, dates back to 1995 when Ulmsten and Petros reported data of 50 patients who received an intravaginal slingplasty for SUI and mixed incontinence.¹ Three years later, in 1998, the Food and Drugs Administration approved the use of retropubic minimally invasive tension-free transvaginal tape (TVT) and, only in 2001, was the trans-obturator tape (TOT) technique introduced.² To date, the positioning of midurethral sling (MUS) is considered the gold standard approach to surgical correction of primary and recurrent SUI along with mixed incontinence associated with SUI predominance and possible incontinence associated with low urethral pressure.³ It is a simple, minimally invasive procedure, which is performed in local/regional anesthesia, offering a 90% cure rate.⁴

Different complications related to the use of midurethral slings have been described in the last few years, but they have probably been underreported, and the quality of most studies is considered poor.⁵ Complications can be summarized as involving: voiding dysfunction, detrusor overactivity, urinary retention, infections erosion/extrusion, dyspareunia/pelvic pain, hematoma and abdomino-pelvic organ injury.⁶

Injuries to the urinary system occur with all types of anti-incontinence surgery. Bladder perforation during a TVT is estimated to occur in approximately 5% of cases, generally managed by a repositioning of the tape.⁷ Trocar passage with TOT and TVT-obturator technique slings minimizes but does not eliminate the risk of this complication.⁸

After an MUS procedure, an intravesical exposed mesh may result from an unrecognized bladder perforation or from bladder erosion. However, the suggested management of these complications is the removal of the polypropylene mesh from the bladder.⁹

Herein, we describe a case of intravesically-exposed sling first diagnosed by trans-labial ultrasound and then successfully treated with endoscopic transurethral resection.

Case Report

A 72-year-old woman came to our Urogynecology Unit complaining of dysuria, hematuria, increasing suprapubic and urethral pain. She had undergone vaginal surgery two months previously in another hospital, for III-degree uterine prolapse, III-degree cystocele and SUI type I-II; a vaginal hysterectomy and placement of an MUS using TOT.

Urogynecologic examination showed a vaginal vault in situ, the cystocele, a regular sub-urethral scar and no signs of vaginal extrusion of the mesh. Bacteriological examination of urine was negative.

A trans-abdominal post-voiding ultrasound showed a significant residual urine volume (150 mL). Using trans-labial ultrasound (TLUS), a malposition of the MUS was identified in the left branch, which appears above rather than below the mid-urethra; moreover, following the course, an intravesical exposition of the branch was seen (Figure 1). The right branch of the sling was normally positioned.

Subsequently, a cysto-urethroscopy was performed, which confirmed the trans-labial ultrasound report, identifying a segment of mesh piercing the bladder on the lateral wall just proximal to the bladder neck in the 2 o'clock position (Figure 2).

With the help of the urologist, we proceeded with a video-assisted transurethral resection (TUR) of the intra-vesical portion of the sling

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Conflict of interests: the authors declare

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using a 26F continuous flow resectoscope with a 30-degree telescope (Karl Storz, Tuttlingen, Germany) (Figure 3). No intra- or post-operative complications occurred. There were no vesical stones nor bleeding. The Foley catheter was removed the 10th day.

Patient was discharged 3 days after surgery. At 3 months post-operative follow-up, the patient was continent, and cystoscopy showed no mesh residual and good resolution of the mucosal involved site.

Discussion

Due to excellent success rates and minimal morbidity, in the past decade, there has been a sharp increase in the use of slings to treat SUI with several tapes, trocars, and modifications. Despite the simplicity and advancement of the technique, there is always the risk of complications. In a recent comprehensive review encompassing more than 13,700 patients, Stanford and Paraiso deduce that the overall incidence of sling-related complications is 8.2%.⁶

The placement of MUS using the transobturator approach was introduced with the idea of reducing complications further. Trans-muscular insertion through the obturator muscles reproduces the natural suspension of the urethra. Moreover, avoiding the retropubic space, it obtains lower rates of vascular, bowel and

bladder injuries compared to the retropubic route. Indeed, this approach does not completely protect against bladder or urethral perforations as noted in published literature.¹⁰ The blind passage of the trocar through the perivesical space may, in fact, determine penetration of the tape into the bladder.

The presence of III-IV degree cystocele could be considered a risk factor during the trocar passage into the obturator space. It is preferable to perform any correction before sling procedure.¹¹ In our case report, the patient was treated for SUI without previous correction of the cystocele and it might be considered an additional causal factor.

Failure to consider bladder or urethral perforations as a possible cause for a patient's voiding symptoms and pain, with a delay in diagnosis and referral to another center, may con-

tribute to the under-reporting of these complications.¹² Urethrocytostomy after surgery is an important tool for early diagnosis and treatment as, if a bladder perforation is recognized immediately, it can be easily managed by correcting the position of the tape and prolonging catheter drainage.⁴ If it is not promptly detected, contact of the polypropylene mesh with urine can cause formation of stones and development of urinary irritative symptoms.¹³ These symptoms are caused by the non-absorbable nature of the polypropylene mesh which determines permanent tissue reactions, pressure necrosis and, finally, erosion. Cystoscopy and mesh resection should be considered as soon as possible. When a clinician suspects an abnormal sling, partially or totally located in the bladder, and cannot perform a cystoscopic evaluation immediately, a simple, mini-inva-

sive alternative to making a hurried diagnosis is a TL-US examination.

Since 1990, TL-US has been used as a valid technique for the examination of patients with disorders of the lower urogenital tract,¹⁴ allowing clinicians to evaluate the urethra, vesical neck, urethral-bladder joint, and even check correct placement of the sling in sub- and mid-urethral positions. Thus, a skilled sonographic operator could make a diagnosis of sling malposition and could identify the part of sling in the bladder, before cystoscopic evaluation.

When the diagnosis is carried out, several approaches, as described in medical literature, need to be considered. Open cystotomy through a suprapubic or retropubic approach is an old method, which reported high morbidity rates and difficulty in tissue dissection.^{15,16}

A suprapubic laparoscopic approach associated with a transurethral nephroscope is also described,¹⁷ but in these cases, the visibility of the mesh close to the bladder neck is suboptimal and in some cases there could be an incomplete resection.¹⁸ Finally, some successfully cases treated with TUR are reported.⁹ TUR permits less invasive surgery, and a completely resection of the intravesical mesh and the infiltrated muscle around the mesh. The retained mesh in the mid-urethra permits the duration of continence after TUR. During the transurethral approach, some possible complications may occur, such as perforation of the bladder or vesico-vaginal fistula formation. Bladder perforation can be treated with prolonged urethral catheterization, and prevented by performing surgery with a non-completely distended bladder. A fistula can be prevented by performing the resection with a finger inserted in vagina which may help in understanding just how thin the wall is in the area near the mesh.⁹

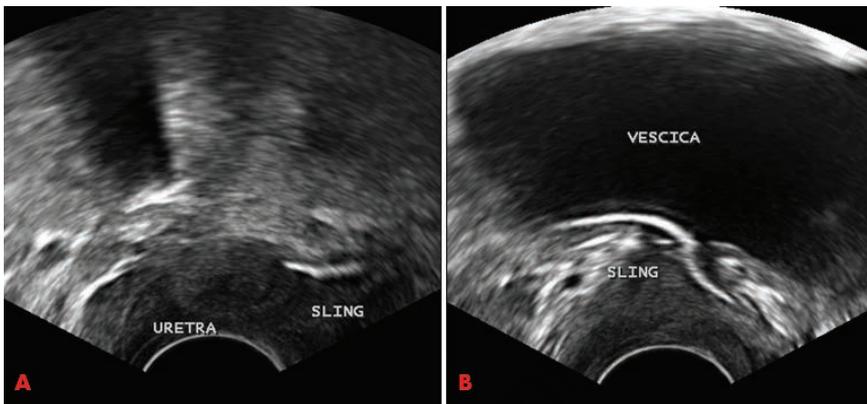


Figure 1. Trans-labial ultrasound images show the left branch of the sling that pass above the mid-urethra (A) and the intravesical exposition of the same branch (B).

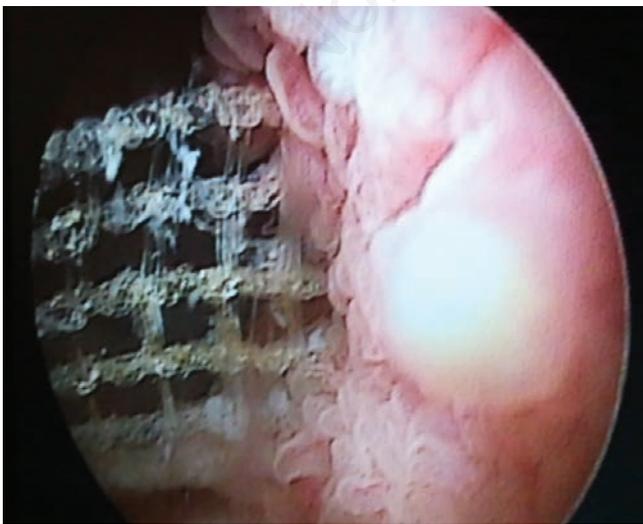


Figure 2. Cysto-urethroscopic image of the intravesical branch of the sling.



Figure 3. Fragments of resected intravesical sling.

Conclusions

Surgical skill of the urogynecologist is fundamental to reduce the risk of complications during an MUS procedure. Every institution should have an adequate training protocol. It is important to be fully aware of complications and make prompt diagnosis of a bladder perforation after a TOT sling. When irritative urinary symptoms appear after a sling procedure and are not resolved with conservative management, it is necessary to study the case further and make a right differential diagnosis.¹⁹ TL-US may be useful to make the correct diagnosis, in the absence of cystoscopy. If possible, endoscopic TUR is the procedure of choice to treat this complication; it is a minimally invasive procedure without any important collateral effects.

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